Trend Study 30-52-03

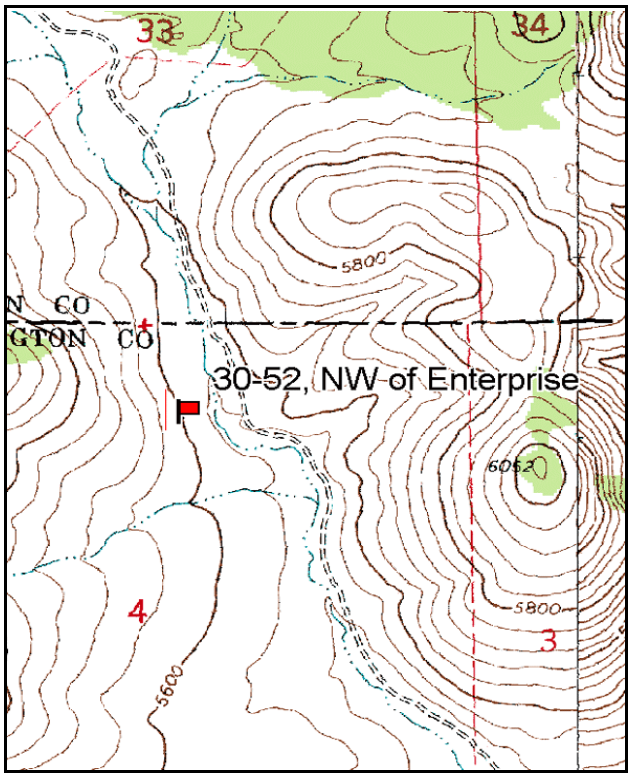
Study site name: Northwest of Enterprise . Vegetation type: Burn-Seeding .

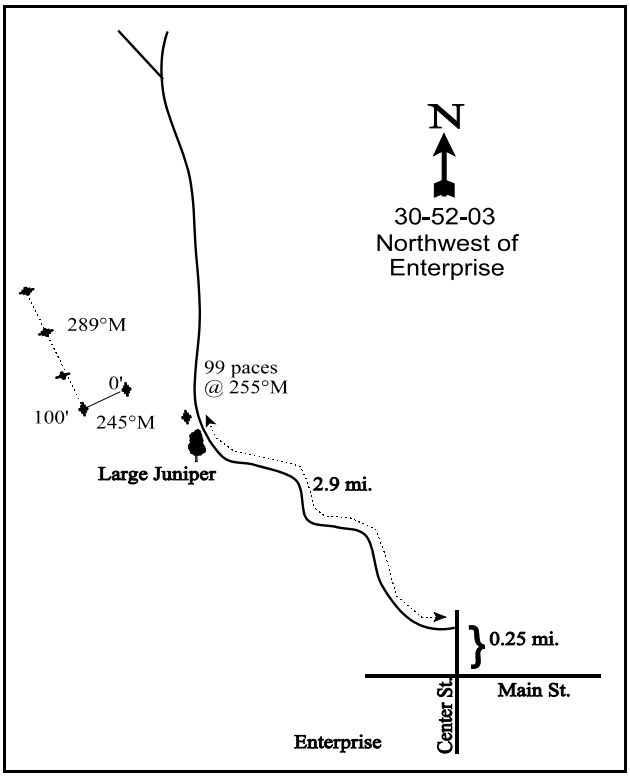
Compass bearing: frequency baseline 245 degrees magnetic. (Line 2-4, 289°M)

Frequency belt placement: line 1 (8 & 94ft), line 2 (37ft), line 3 (51ft), line 4 (63ft).

LOCATION DESCRIPTION

Starting from the town of Enterprise, turn north on Center Street and travel 0.25 miles. Turn left (west) and travel 2.9 miles. Stop where the road makes a turn to the north. On the left side of the road, before the bend, are a few junipers. Past the junipers is a witness post on the left side of the road. From the witness post the 0-foot baseline stake is 99 paces at 255 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height.





Map Name: Hebron

Diagrammatic Sketch

Township 37S , Range 17W , Section 4

GPS: NAD 27, UTM 12S 4165067 N, 256231 E

DISCUSSION

Northwest of Enterprise - Trend Study No. 30-52

This trend study is located on critical deer winter range northwest of the town of Enterprise. Elevation is approximately 5,600 feet with a moderately steep slope (25%) and northeast aspect. The range type is Wyoming big sagebrush-grass. Little sign of deer was noted during the 1992 reading. Pellet group data from 1998 estimated 40 deer and 2 cow days use/acre (99 ddu/ha and 5 cdu/ha). The site burned prior to the 2003 reading which eliminated all the browse in the entire area. The lower, flatter terrain was chained after seed was flown on. Deer still use the area and pellet group data from 2003 estimated 23 deer days use/acre (56 ddu/ha). Cattle had used the site sometime in 2002 at an estimated 12 days use/acre (30 cdu/ha) but had not yet used the site in 2003.

Soils are moderately deep but rocky on the surface and within the profile. Effective rooting depth is estimated at about 19 inches. Rock and erosion pavement are abundant on the surface, making up nearly 40% cover in 2003. The upper part of the site is very rocky as soil has moved down slope. There are signs of past erosion in the form of soil pedestalling and terracing of the slope, but current litter and vegetative cover seem to be sufficient to hold the soil in place.

The key browse species prior to the fire was Wyoming big sagebrush, which comprised 55% of the browse cover in 1998. The sight supported an over mature stand of sagebrush, which has steadily declined in density from 6,733 plants/acre in 1982 to 2,660 by 1998. Utilization was moderate to heavy in 1982 and 1992, but more light to moderate in 1998. Percent decadence increased from 23% in 1982 to 48% in 1998. Vigor was good that year, yet 41% of the decadent sagebrush were classified as dying. Reproduction was poor with dead plants nearly as numerous as mature plants (1,180 live vs 1,160 dead plants/acre). The wildfire prior to the 2003 reading eliminated all of the sagebrush in the area.

Cliffrose provided some additional forage with an estimated 380 plants/acre in 1998. It had received moderate to heavy use, yet vigor was normal and reproduction good. The only other browse species of significance was broom snakeweed. Juniper trees were scattered throughout the site. Point-quarter data from 1998 estimated 20 trees/acre with an average basal diameter of 8 inches. Overhead canopy cover averaged 8%. Wildfire eliminated nearly all of the shrubs on the site. Burned juniper trees on the more level terrain were chained and seeded. The only shrubs left in 2003 were a few resprouting ephedra, some broom snakeweed, and a good stand of seeded prostrate kochia which numbered 3,200 plants/acre. Some kochia was moderately and heavily browsed in 2003.

Perennial grasses were abundant and diverse with mutton and Sandberg bluegrass being the most common prior to the fire. Annual cheatgrass was also present, providing 17% of the grass cover in 1998. Forbs were fairly diverse, yet no species was common. The 12 annual and perennial forbs encountered in 1998 provided less than 1% total cover. The most common species included deervetch, longleaf phlox, and an *astragalus*. After the burn, the herbaceous composition is still dominated by perennial grasses, but western wheatgrass and galleta now provide most of the grass cover (75%). Sandberg bluegrass was also common in 2003. Annual cheatgrass is still present but not nearly as abundant as it was in 1998. Forbs are still lacking and produced only about 1% total cover in 2003. Gooseberryleaf globemallow was the only fairly common species.

1982 APPARENT TREND ASSESSMENT

This study is fairly typical of depleted Wyoming big sagebrush range. Most parameters indicate soil and vegetative trend are both declining. Erosion is extensive and increaser and/or invader plants occupy a prominent place in the plant composition. The key species, Wyoming big sagebrush, does not appear to be maintaining itself. Direct management action will likely be required to reverse the trend. Restrictions on animal use, while a viable option, are unlikely to quickly bring the site to a productive state.

1992 TREND ASSESSMENT

Basal vegetative cover has more than doubled since 1982, while cover of bare ground has decreased by 42%. Protective ground cover has increased from 87% to 92%. All other observations point to an improving soil trend. The key browse species, Wyoming big sagebrush, has no recruitment, density has declined by 42%, and percent decadence has increased. On the positive side, utilization is lighter and vigor has improved. Broom snakeweed had declined in density by 34%. Overall, the browse trend is down. Quadrat frequencies for grasses are down slightly, while forbs have increased. Combined, summed quadrat frequencies of forbs and grasses have remained constant since the previous reading.

TREND ASSESSMENT
soil - up (5)
browse - down (1)
herbaceous understory - stable (3)

1998 TREND ASSESSMENT

Trend for soil is down slightly. Percent bare ground has increased from 8% to 13% and litter cover has declined from 46% to 38%. However, erosion does not currently appear to be a serious problem. Trend for browse is slightly down. Density of Wyoming big sagebrush has steadily declined since 1982 even though heavy utilization has declined since 1992. Percent decadence has remained high (48%), vigor is poor on 42% of the decadent plants, and reproduction is not sufficient to maintain the population. Cliffrose is found on the site in small numbers. Density has increased from 133 plants/acre to 380. This increase in density from 1992 to 1998 is mostly due to the much larger sample taken in 1998. Reproduction is good. Utilization of this preferred shrub is moderate to heavy. Trend for the herbaceous understory is up for perennial grasses, but stable for forbs which only make up only 4% of the herbaceous cover. Sum of nested frequency for perennial grasses has increased dramatically with a significant increase in the frequency of mutton and Sandberg bluegrass.

TREND ASSESSMENT
soil - down slightly (2)
browse - down slightly (2)
herbaceous understory - up (5)

2003 TREND ASSESSMENT

This site burned prior to the 2003 reading which eliminated all of the sagebrush on this site. The soil trend is down slightly due to a decline in litter and vegetation cover combined with a 27% increase in cover of bare ground. Erosion is not a problem however, due in part to the rocky nature of the soil surface. Trend for browse is down due to the elimination of Wyoming big sagebrush and cliffrose from the site. A good stand of seeded prostrate kochia has established at an estimated density of 3,100 plants/acre. Some of these plants displayed moderate to heavy use in 2003. Trend for the herbaceous understory is down slightly due to a decline in the sum of nested frequency for perennial grasses and forbs. Perennial grasses still dominate the composition with western wheatgrass, galleta, and Sandberg bluegrass providing most of the grass cover. Some seeded crested wheatgrass has established on the site. Forbs are still lacking with only gooseberryleaf globemallow being fairly common.

TREND ASSESSMENT
soil - down slightly (2)
browse - down (1)
herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --
Management unit 30 , Study no: 52

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
G	Agropyron cristatum	a-	a-	b18	-	.27
G	Agropyron smithii	ab68	a44	b91	.55	3.40
G	Agropyron spicatum	-	-	3	-	.15
G	Bromus tectorum (a)	-	b261	a56	3.09	.16
G	Hilaria jamesii	a55	a81	b124	1.78	5.25
G	Koeleria cristata	2	2	-	.03	-
G	Oryzopsis hymenoides	11	1	6	.00	.16
G	Poa fendleriana	b60	c101	a-	5.88	-
G	Poa secunda	a41	c215	b132	5.57	2.00
G	Sitanion hystrix	b54	b54	a5	.92	.03
G	Unknown grass - perennial	3	-	-	-	-
G	Vulpia octoflora (a)	-	b67	a12	.30	.02
Total for Annual Grasses		0	328	68	3.40	0.18
Total for Perennial Grasses		294	498	379	14.76	11.28
Total for Grasses		294	826	447	18.17	11.46
F	Allium spp.	-	-	8	-	.01
F	Antennaria rosea	-	3	-	.03	-
F	Astragalus spp.	5	11	-	.19	-
F	Calochortus nuttallii	a3	b16	ab9	.03	.02
F	Collinsia parviflora (a)	-	b18	a-	.04	-
F	Crepis acuminata	-	-	2	-	.03
F	Cymopterus spp.	-	6	1	.07	.03
F	Draba spp. (a)	-	b20	a-	.05	-
F	Erigeron pumilus	-	1	-	.03	-
F	Eriogonum umbellatum	2	-	-	-	-
F	Helianthus annuus (a)	-	-	2	-	.00
F	Lithospermum spp.	-	-	-	-	.00
F	Lotus plebeius	c94	b39	a1	.18	.00
F	Machaeranthera canescens	3	-	-	-	-
F	Microsteris gracilis (a)	-	b25	a-	.05	-
F	Phlox longifolia	a15	b32	a13	.11	.08
F	Plantago patagonica (a)	-	4	-	.01	-
F	Sisymbrium altissimum (a)	-	2	-	.00	-
F	Sphaeralcea grossulariaefolia	a-	a-	b34	-	.71

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
F	Unknown forb-annual (a)	-	-	2	-	.03
Total for Annual Forbs		0	69	4	0.16	0.04
Total for Perennial Forbs		122	108	68	0.65	0.90
Total for Forbs		122	177	72	0.81	0.94

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 30 , Study no: 52

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Amelanchier utahensis	1	0	-	-
B	Artemisia tridentata wyomingensis	76	0	9.16	-
B	Chrysothamnus nauseosus	0	0	.38	-
B	Chrysothamnus viscidiflorus	14	0	.51	-
B	Cowania mexicana stansburiana	12	0	.49	-
B	Ephedra viridis	0	1	-	-
B	Gutierrezia sarothrae	54	46	1.14	.65
B	Juniperus osteosperma	2	0	5.09	-
B	Kochia prostrata	0	36	-	.98
B	Purshia tridentata	1	0	-	-
Total for Browse		160	83	16.79	1.64

CANOPY COVER, LINE INTERCEPT --
Management unit 30 , Study no: 52

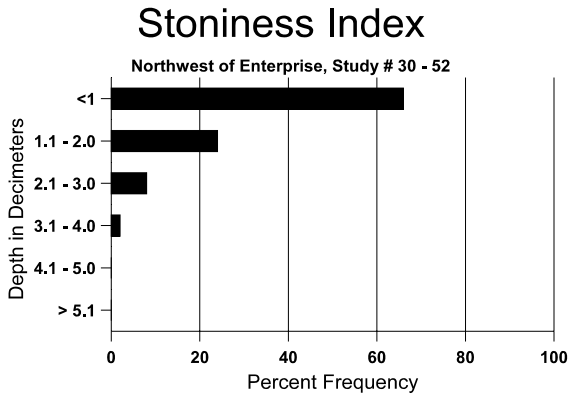
Species	Percent Cover	
	'98	'03
Gutierrezia sarothrae	-	.35
Juniperus osteosperma	8.39	-
Kochia prostrata	-	2.13

BASIC COVER --
Management unit 30 , Study no: 52

Cover Type	Average Cover %		
	'92	'98	'03
Vegetation	4.25	38.27	14.06
Rock	30.50	36.20	35.83
Pavement	10.75	6.67	3.94
Litter	45.75	38.02	38.18
Cryptogams	.75	2.40	.03
Bare Ground	7.50	13.41	16.97

SOIL ANALYSIS DATA --
Management unit 30, Study no: 52, Study Name: Northwest of Enterprise

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
4.8	69.2 (17.8)	6.6	32.6	45.2	22.2	2.7	25.9	732.8	0.5



PELLET GROUP DATA --
Management unit 30 , Study no: 52

Type	Quadrat Frequency	
	'98	'03
Rabbit	10	18
Horse	1	-
Deer	16	12
Cattle	-	4

Days use per acre (ha)	
'98	'03
-	-
-	-
40 (99)	23 (56)
2 (5)	12 (30)

BROWSE CHARACTERISTICS --
Management unit 30 , Study no: 52

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Amelanchier utahensis											
82	**0**	-	-	-	-	-	0	0	0	0	-/-
92	**0**	-	-	-	-	-	0	0	0	0	-/-
98	**20**	-	-	-	20	-	0	0	100	0	-/-
03	**0**	-	-	-	-	-	0	0	0	0	-/-
Artemisia tridentata wyomingensis											
82	**6733**	-	600	4600	1533	-	33	23	23	24	22/23
92	**3933**	-	200	1800	1933	-	61	14	49	2	24/24
98	**2660**	40	200	1180	1280	1160	23	0	48	20	19/28
03	**0**	-	-	-	-	-	0	0	0	0	-/-
Chrysothamnus viscidiflorus											
82	**66**	-	-	66	-	-	0	0	0	0	4/7
92	**66**	-	-	66	-	-	0	0	0	0	11/14
98	**800**	-	220	560	20	-	0	0	3	0	11/18
03	**0**	-	-	-	-	-	0	0	0	0	-/-
Cowania mexicana stansburiana											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**133**	-	133	-	-	-	0	0	-	0	-/-
98	**380**	80	120	260	-	-	26	47	-	0	31/25
03	**0**	-	-	-	-	-	0	0	-	0	-/-
Ephedra viridis											
82	**133**	-	-	133	-	-	50	0	0	0	11/6
92	**200**	-	200	-	-	-	33	0	0	0	-/-
98	**0**	-	-	-	-	-	0	0	0	0	32/51
03	**40**	-	20	-	20	-	0	100	50	0	17/12
Gutierrezia sarothrae											
82	**8266**	-	533	6600	1133	-	0	0	14	6	8/11
92	**5466**	66	-	5466	-	-	0	0	0	0	11/10
98	**4060**	80	540	3380	140	40	0	0	3	2	6/8
03	**1740**	20	380	680	680	640	5	5	39	28	4/7
Juniperus osteosperma											
82	**66**	-	-	66	-	-	0	0	-	0	67/131
92	**0**	66	-	-	-	-	0	0	-	0	-/-
98	**40**	-	-	40	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Kochia prostrata											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**3100**	-	1040	2060	-	-	27	4	-	0	8/11
Leptodactylon pungens											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	4/5
Purshia tridentata											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**20**	-	-	20	-	-	100	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	-/-